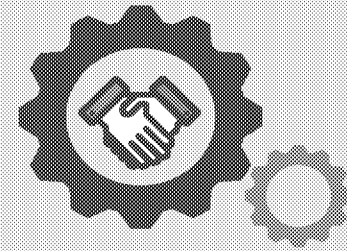


Team App Building Workshop

Oct 25 - 26, 2016

Washington, DC

Data Viz EPA & CDC



Members:

Michael Firestone ,
David G. Smith,
Shannon Dewitt,
Paul-Harvey Weiner ,
Patti Nelson &
Sala Senkayi



Historical Water/Air Data!

- *The earliest samples on the Mississippi were collected by Captain Talcott of the US Army in 1838 but no record is kept of the sampling method used.*

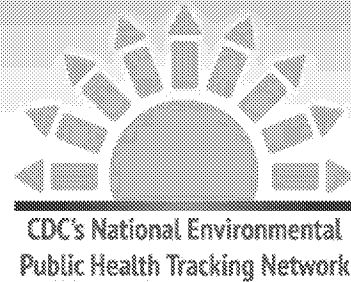
History of Fluvial Hydraulics

By R. J. Garde

- *Asthma cost the US \$56 billion in 2007. Additionally, air pollution is the leading environmental threat to human health, according to the CDC.*

Combining these data allows decision makers to appreciate connections between multi-dimensional data sets and provides novel ways to interpret data through the use of new, innovative data visualization tools such as Qlik!

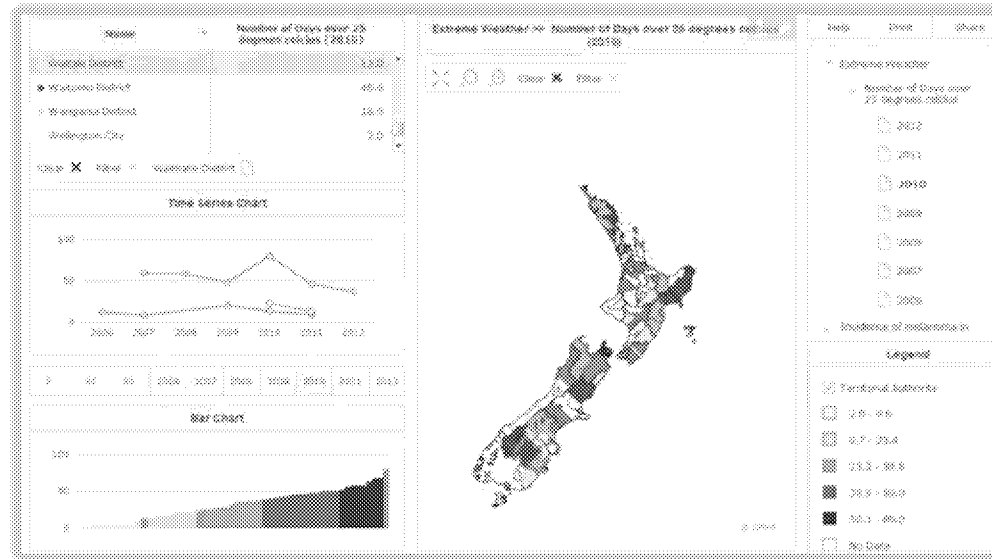
Data Visualization Tool Using EPA & CDC Data



Relationship of Asthma & PM2.5 in Children

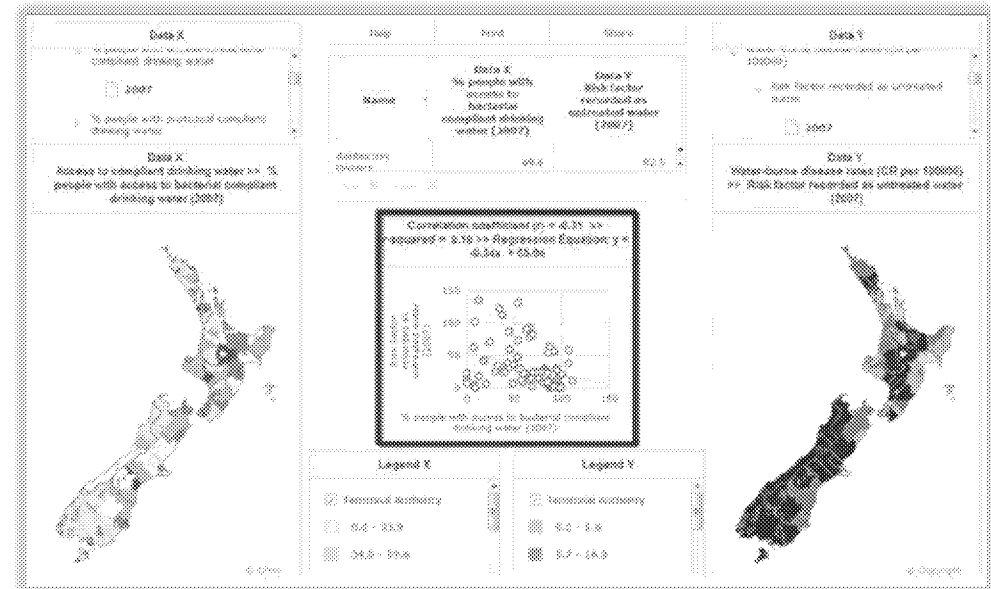


Background & Project Importance

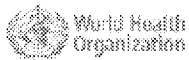


←Option # 1-One Area

→Option #2- Two Areas

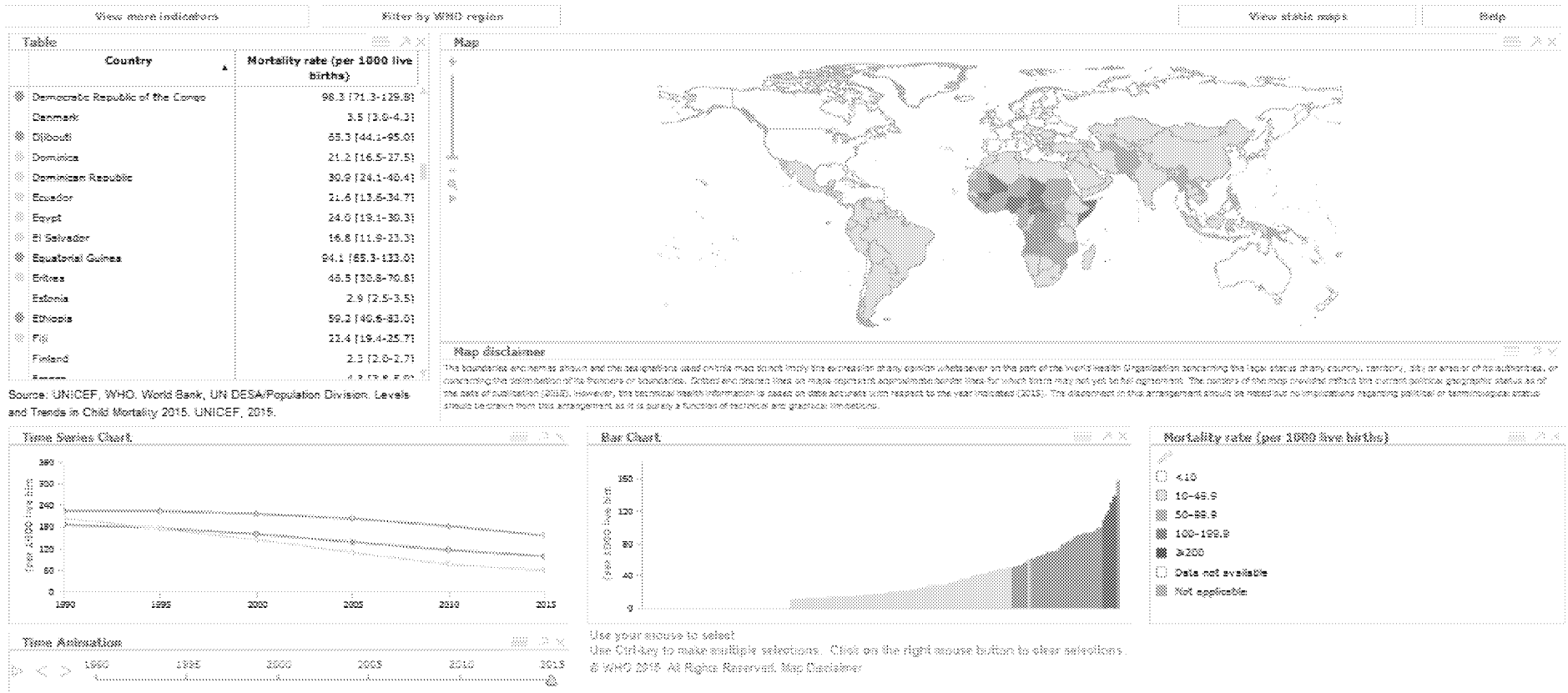


Background & Project Importance

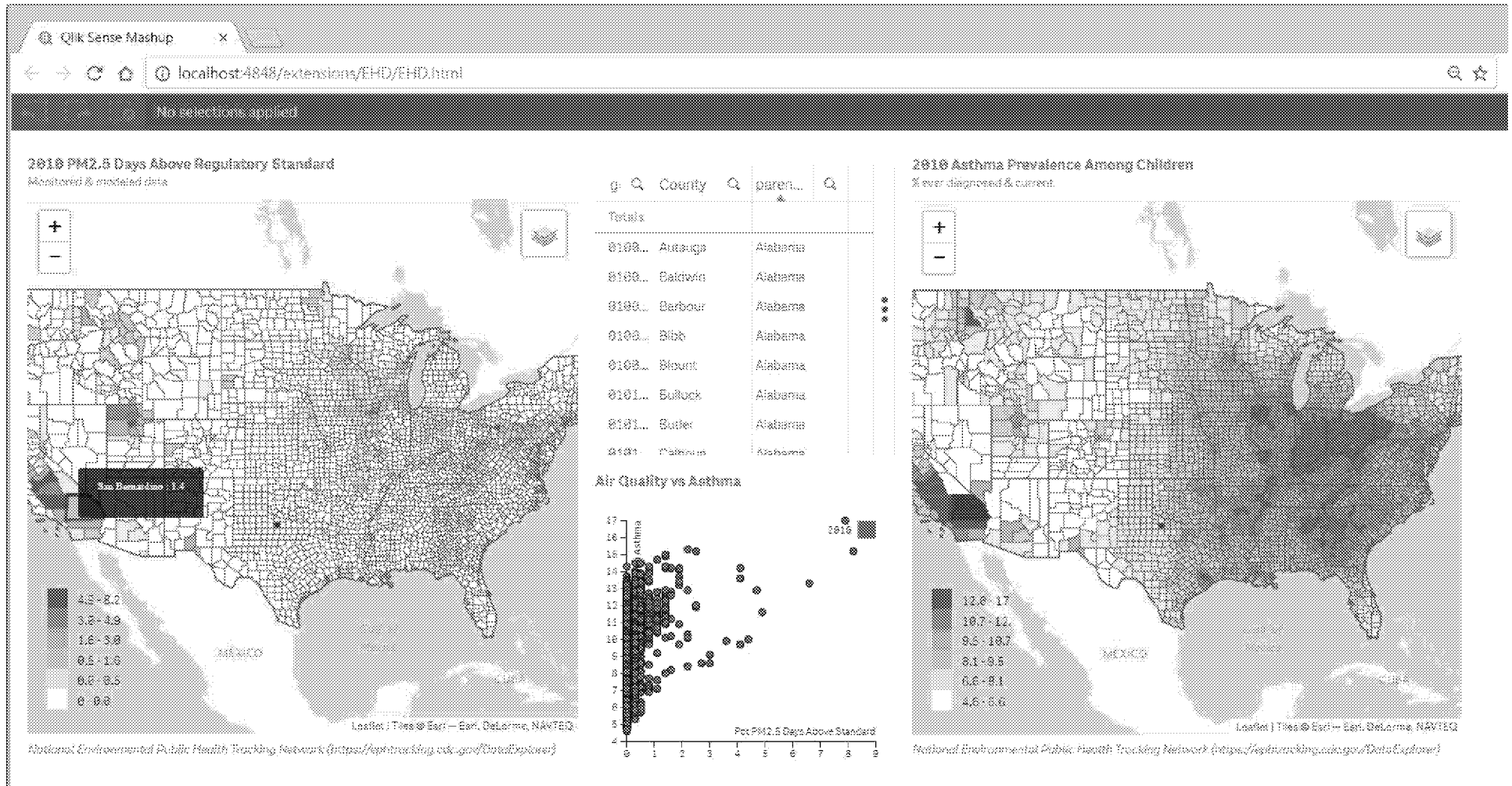


MDG4: Child mortality, 1990–2015

Under-five mortality rate (probability of dying by age 5 per per 1000 live births), 2015



Current App Progress...

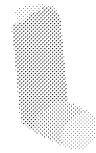
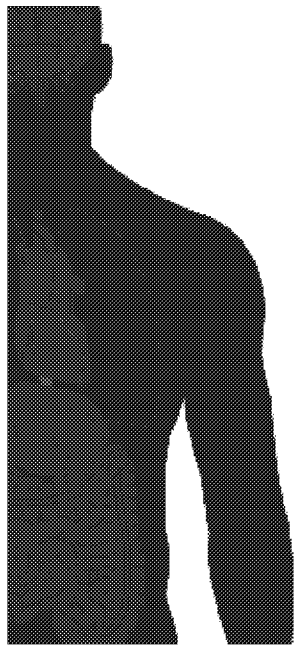


Asthma in the US

Growing every year via...

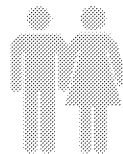
May 2011

^{CDC}
*Vitalsigns*TM



1 in 12

About 1 in 12 people (about 25 million) have asthma, and the numbers are increasing every year.



12M

About 1 in 2 people (about 12 million) with asthma had an asthma attack in 2008, but many asthma attacks could have been prevented.



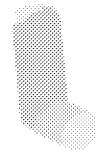
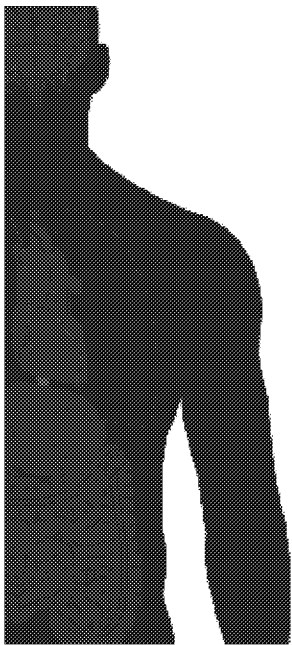
56 Billion

Asthma cost the US about \$56 billion in medical costs, lost school and work days, and early deaths in 2007.

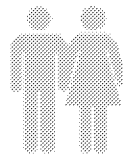
**More than half (53%) of people with asthma had an asthma attack in 2008.
More children (57%) than adults (51%) had an attack.**

Asthma in the US

Amazing Facts!!!



Asthma is a lifelong disease that causes **wheezing, breathlessness, chest tightness, and coughing**. It can limit a person's quality of life. While we don't know why asthma rates are rising, we do know that most people with asthma control it.



The number of people diagnosed with asthma **grew by 4.3 million from 2001 to 2009**. From 2001 through 2009 asthma rates rose the most among black children, almost a 50% increase. Asthma was linked to **3,447 deaths (about 9 per day) in 2007**.



Asthma costs in the US grew from about \$53 billion in 2002 to about \$56 billion in 2007, about a **6% increase**.

Asthma in the US

CDC Success Stories-NY/MD...

May 2011

^{CDC}
*Vitalsigns*TM

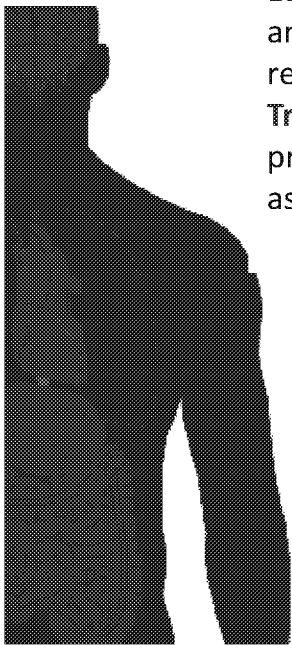
What did Tracking do in NY?

Each fall NYC sees a large increase in hospital stays and in emergency department visits for asthma, especially among children. **Illness rates in the fall can be three times higher than rates during the summer.** Possible reasons include infections among children returning to school, seasonal pollen, and cooler weather. **The NYC Tracking Program analyzed childhood asthma data.** It used the results to write messages for health care providers. The messages—sent through the city's Health Alert Network—urged providers to update patients' asthma management plans in time for school year start.

What did Tracking do in MD?

The Maryland Tracking Program used asthma emergency room visit and hospital discharge data from the health department and air data from the MDE and the Environmental Protection Agency (EPA) to carry out an EPA- funded project, to examine the relationship between asthma rates and fine particulate levels in and around Baltimore. **On bad air quality days, hospital visits increased!**

Improved public health in these and in many other examples, thus CDC's participation in the App Development workshop!

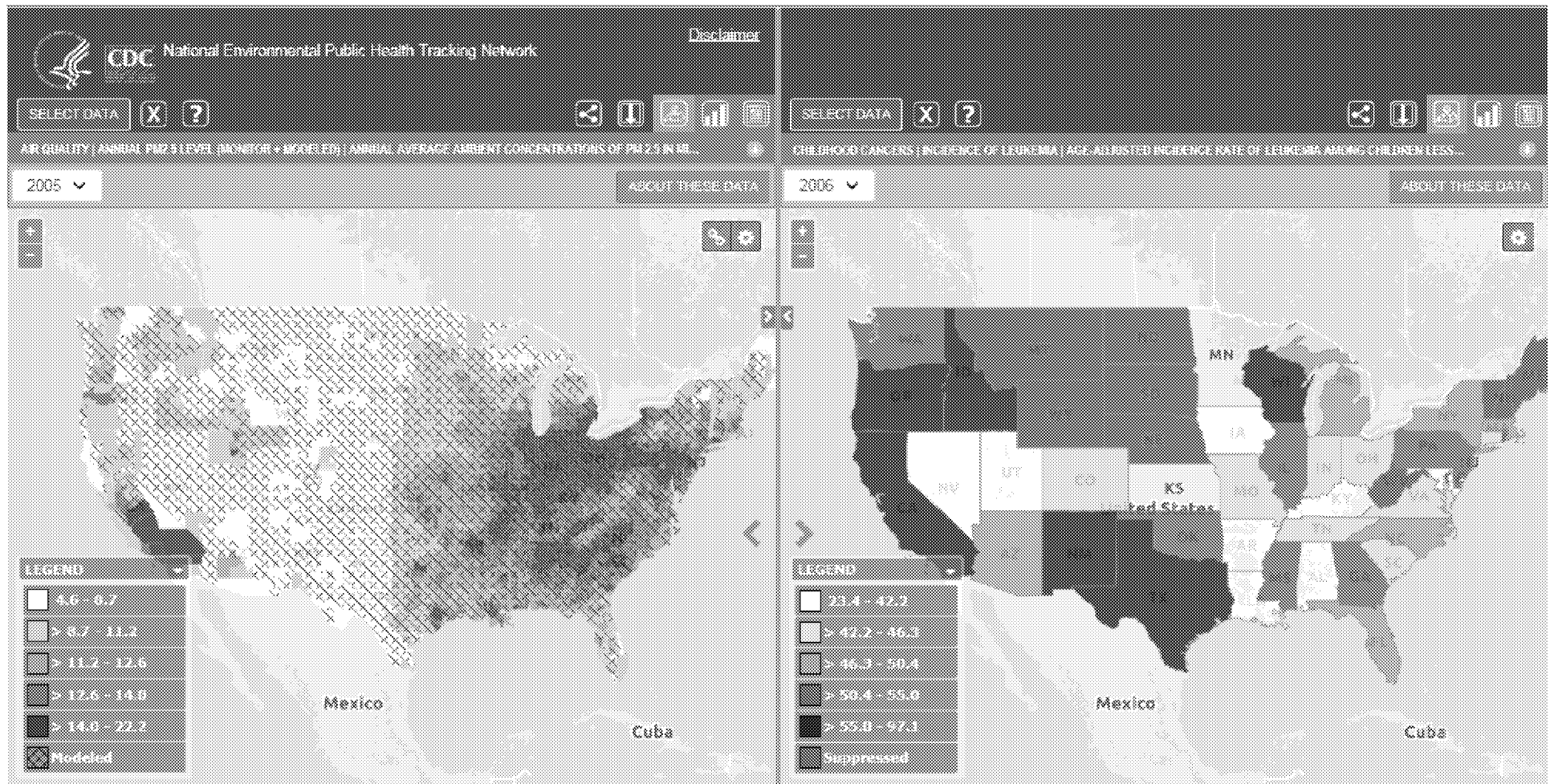


Common Mapping Examples...



Childhood Cancer/PM2.5 – Further Analysis!

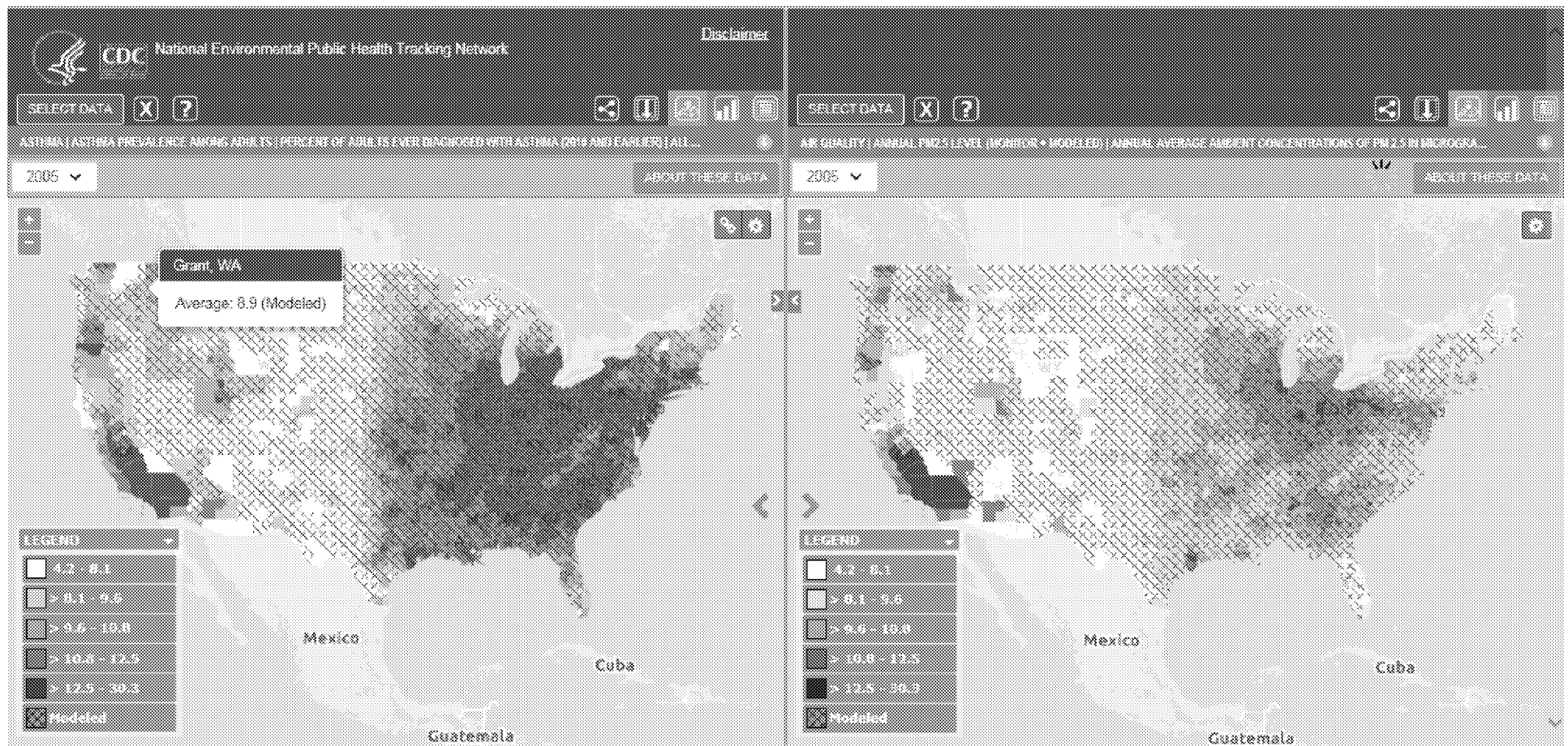
- Left map - ANNUAL PM2.5 LEVEL,
- Right map - INCIDENCE OF LEUKEMIA (CHILDHOOD)



Adult Asthma/PM2.5 – A good match!

→ Left map - Adult Asthma

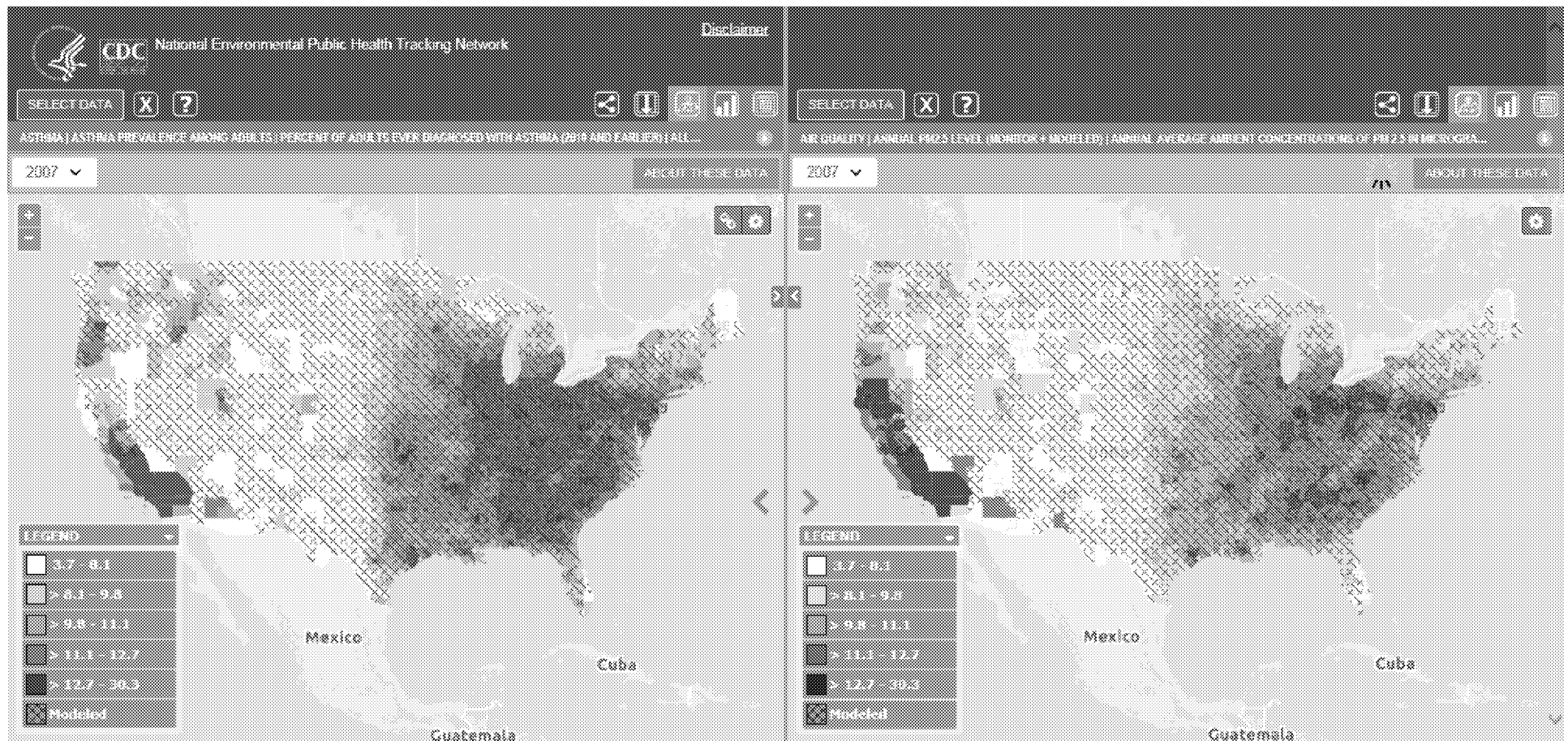
→ Right map - PM2.5 Monitor + Modeled - 2005



Adult Asthma/PM2.5 – A good match!

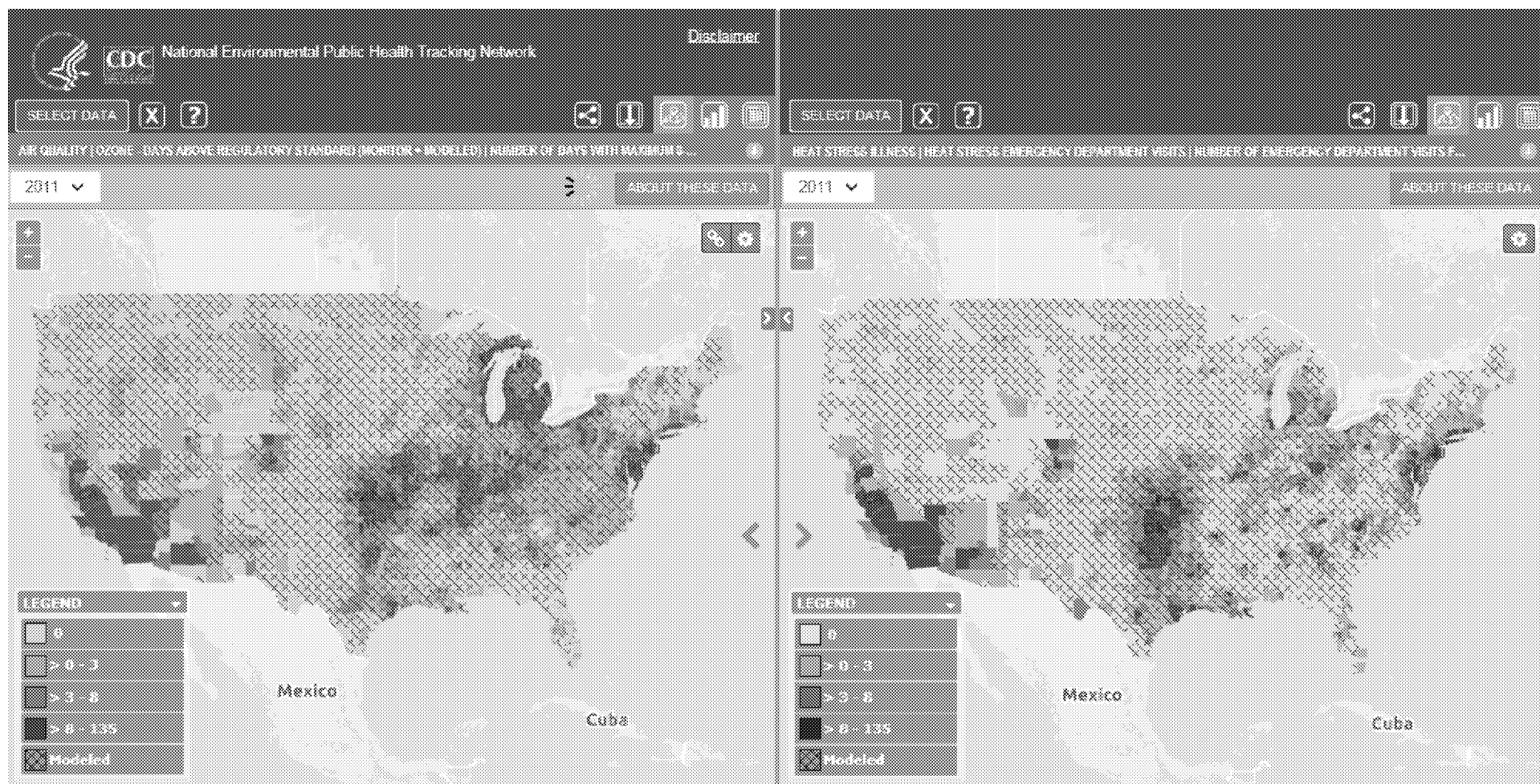
→ Left map - Adult Asthma

→ Right map - PM2.5 Monitor + Modeled - 2007



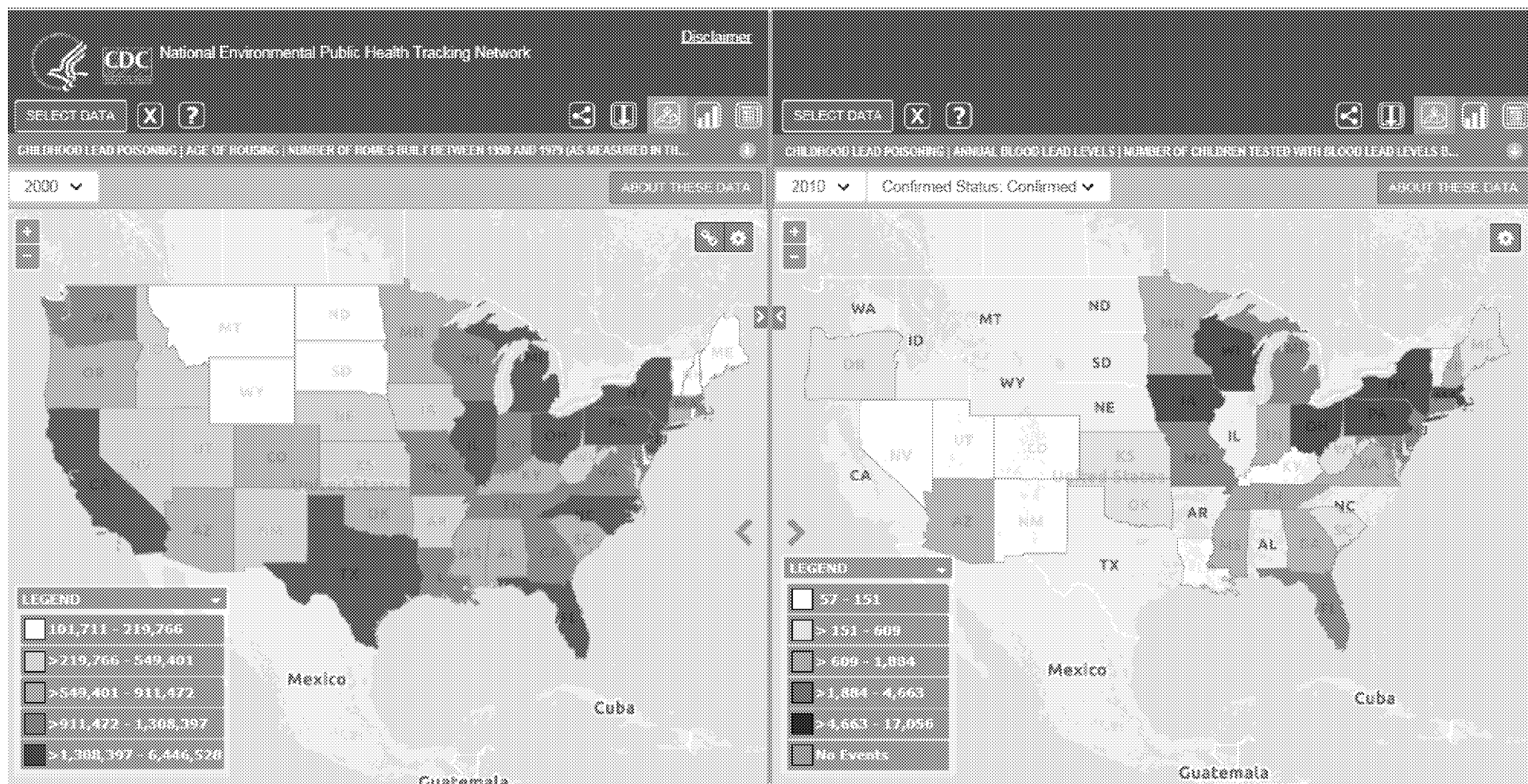
Ozone/Heat Stress – A good match!

- Left map - OZONE DAYS ABOVE REGULATORY STANDARD,
- Right map - HEAT STRESS # OF EMERGENCY DEPARTMENT VISITS



Childhood Blood Lead/Homes – Interesting!

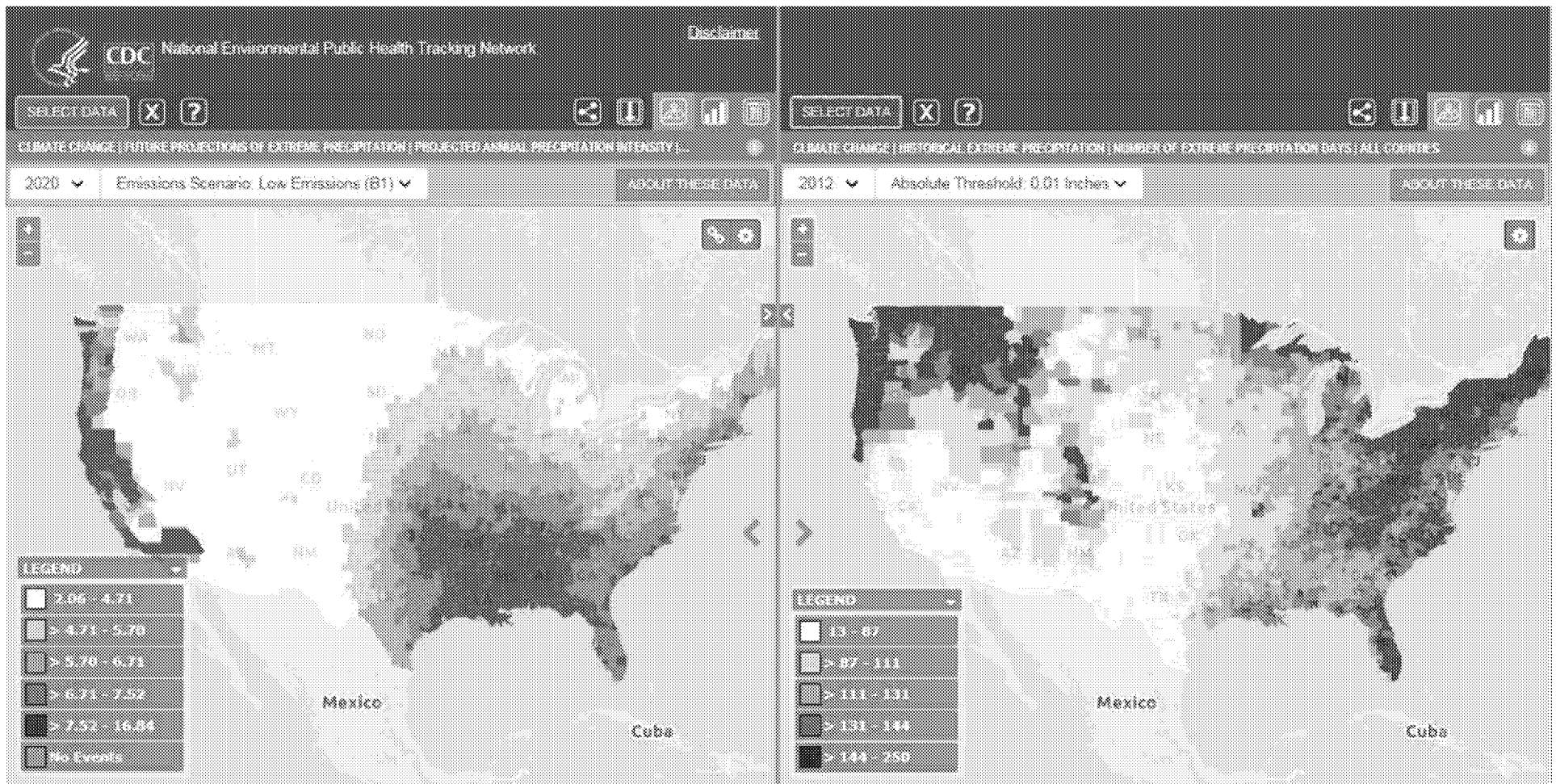
- Left map - AGE OF HOUSING (1950-1979),
- Right map - CHILDHOOD ANNUAL BLL



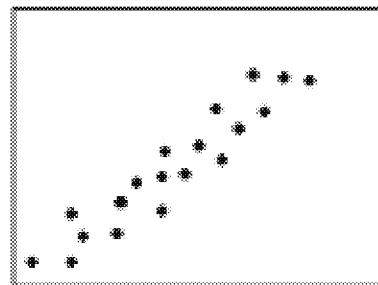
Precipitation...

→ Left map - Future Predicted extreme Precipitation

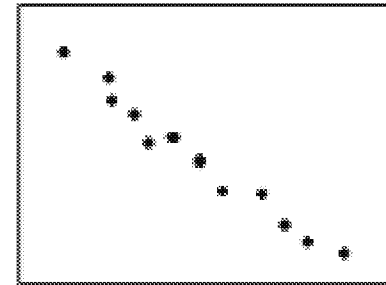
→ Right map - Historical Predicted extreme Precipitation



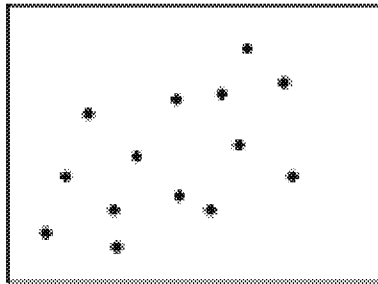
Scatterplot Trends & Relationships



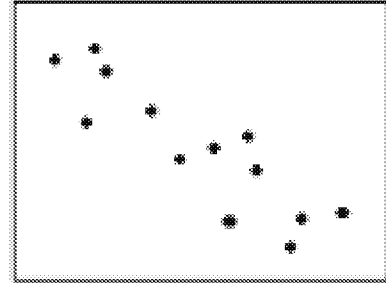
Strong Positive



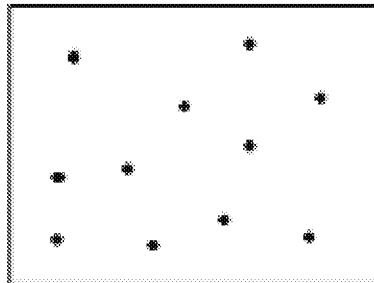
Strong Negative



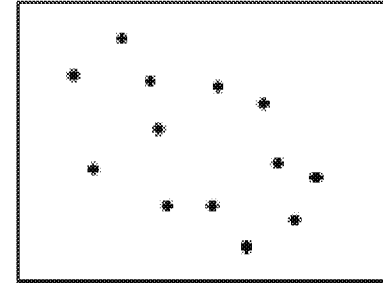
Weak Positive



Moderate Negative

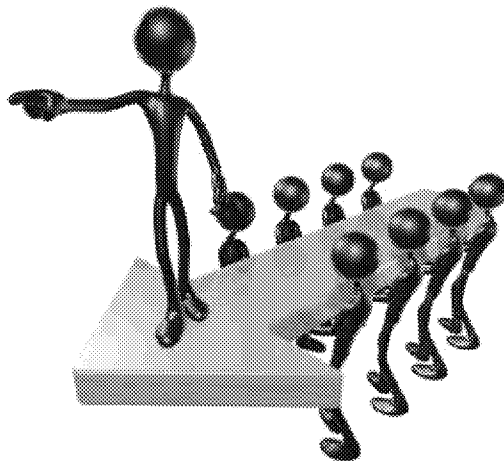


None



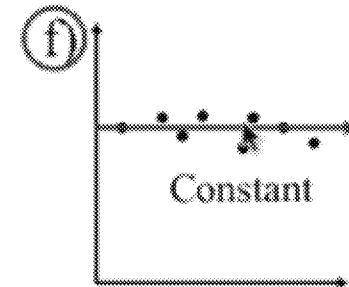
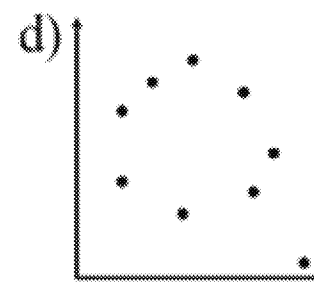
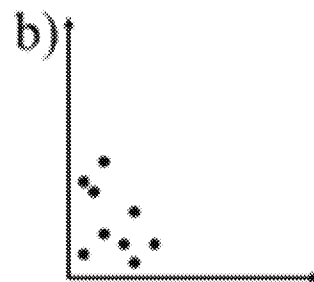
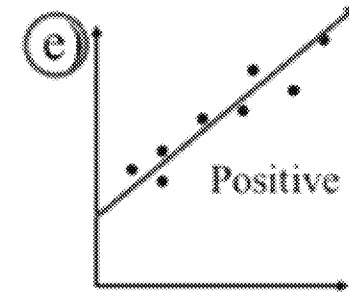
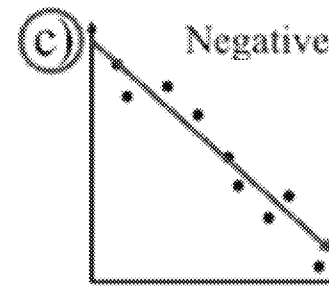
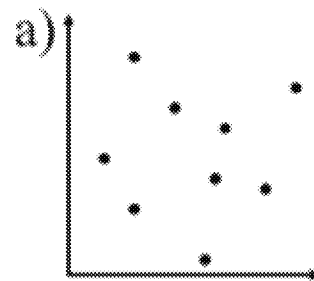
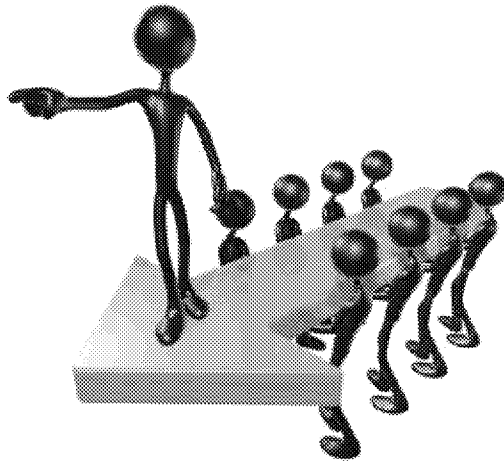
Weak Negative

Note Strength
and Direction



Scatterplot Trends & Relationships

Note Strength
and Direction

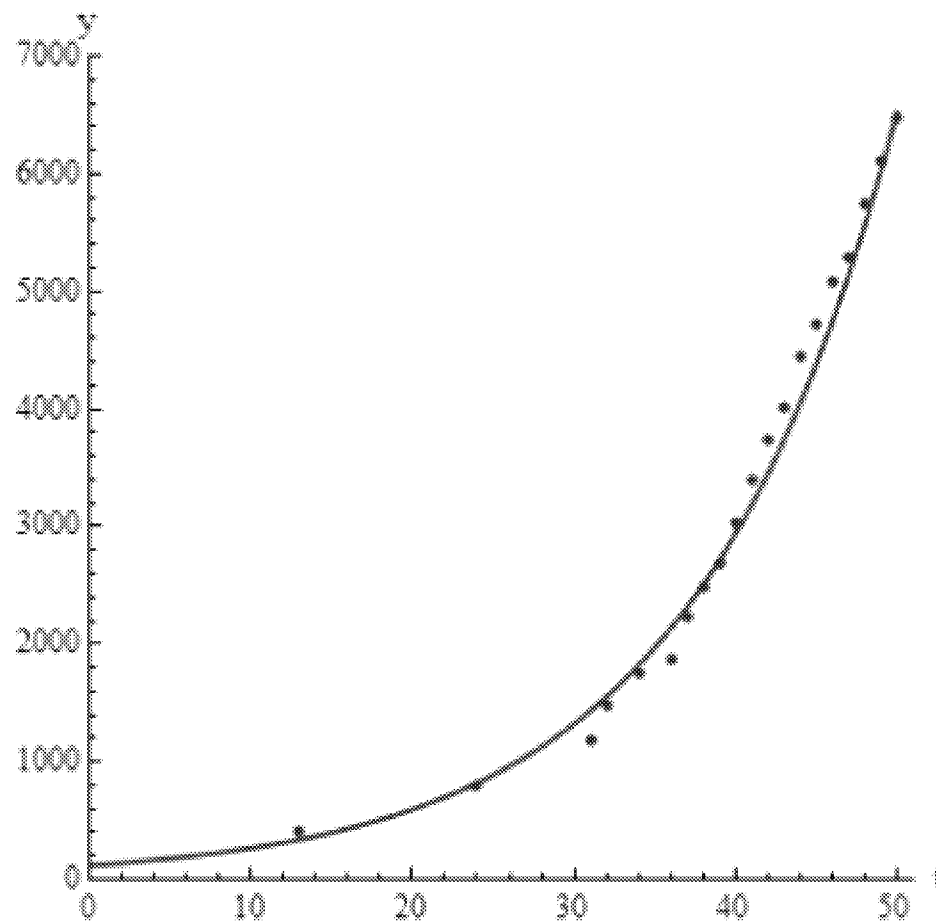


Scatterplot Trends & Relationships

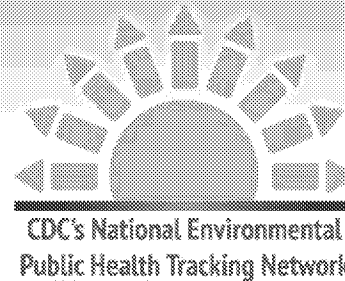
Year	t = years after 1950	Eagle Pairs
1963	13	417
1974	24	791
1981	31	1188
1982	32	1480
1984	34	1757
1986	36	1875
1987	37	2238
1988	38	2475
1989	39	2680
1990	40	3035
1991	41	3399
1992	42	3749
1993	43	4015
1994	44	4449
1995	45	4712
1996	46	5094
1997	47	5295
1998	48	5748
1999	49	6104
2000	50	6471

Exponential Relationship

Return of the Bald Eagle Example



Data Visualization Tool Using EPA & CDC Data



Demo & Future Projects!

1. WHO Viz App http://gamapserver.who.int/gho/interactive_charts/MDG4/atlas.html
2. Monitoring New Zealand's Environmental Health main webpage: <http://www.ehinz.ac.nz/>
3. App (EDH): https://edap.epa.gov/public/extensions/Env_HealthViz3/Env_HealthViz3.html
4. App (Air): <https://qlikviz.epa.gov/hub/my/work> *** NEW***
5. CDC: <https://ephtracking.cdc.gov/DataExplorer/>
6. CDC measures: https://ephtracking.cdc.gov/docs/API_Measure_Guide.pdf